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Microeconomic Consequences and Macroeconomic Causes of Foreign Direct Investment in Southern African Economies

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Abstract

The causes and consequences of foreign direct investment (FDI) in developing countries remains a subject of debate among researchers and policymakers alike. The authors use international data and a new micro-data set of firms in thirteen Southern African Developing Countries (SADCs) to investigate the benefits and determinants of FDI in this region. FDI appears to have facilitated local development in the SADC region. Foreign firms tend to perform better than domestic firms, tend to be larger, are located in richer and better-governed countries and in countries with more competitive financial intermediaries, and they are more likely to export than domestic firms. They also exhibit positive spillover effects to domestic firms. Relying on a standard model to predict the country-level FDI inflows per capita, the authors find that SADC is attracting their expected level of FDI inflows, at least relative to its income level, human capital, demographic structure, institutions, and economic track record. There are some differences between SADC and the rest of the world in FDI behavior: in SADC, the income level is less important and openness more so. The authors use two comparison groups to compare with SADC to shed light on why other regions have attracted more FDI per capita than SADC. The factors that explain SADC's low FDI inflows are economic fundamentals (e.g., previous growth rates, average income, phone density, and the adult share of population).

This paper—a product of the Finance and Private Sector Development, and Trade and Integration Teams, Development Research Group; and Private Sector Development Division, Africa Region Department—is part of a larger effort in the departments to understand the causes and consequences of foreign direct investment in developing countries. Policy Research Working Papers are also posted on the Web at http://econ.worldbank.org. The author may be contacted at lxu1@worldbank.org.

Microeconomic Consequences and Macroeconomic Causes of Foreign Direct Investment in Southern African Economies[1]

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Key words: FDI, spillovers, firm performance, exports, Africa, SADC.

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1. Introduction

Foreign direct investment (FDI) can reduce income gaps between developing and advanced economies. In the neoclassical world with perfect capital mobility and technology transfer, capital readily flows from rich to poor countries, seeking higher returns in capital-scarce economies. We do not see this in the data. Even though the southern African countries (the South African Development Community, SADC hereafter) are poor on average, per capital FDI inflows for the SADC region are only 36.6 U.S. dollars (in 2000 value), which is about 18 percent of the average level for the non-SADC sample (202.8 dollars), and 58 percent of the average level for the similar-income sample (63.2 dollars). Moreover, within the SADC region, country differences are huge: FDI per capita (in 2000 U.S. value) ranges from single digits (Malawi, Zimbabwe, Madagascar, Democratic Republic of Congo, and Tanzania) to 10 to 30 dollars (Mozambique, Zambia, Mauritius, and Swaziland), to 50 to 100 dollars (Lesotho, South Africa, and Angola), and to 167 dollars in the outlier in this region, the middle-income Botswana. Even within this region we detect a positive relationship between average income and FDI per capita. This pattern holds in the world sample as well. Thus, the hope of relying on FDI inflows as a "supply side remedy" to catapult poor countries into the fast track of development, as prescribed by the United Nations (1999), is not likely to materialize soon.

Perhaps with these low FDI numbers in mind, policy makers and development agencies are concerned about FDI performance in SADCs.[2] One hopes that FDI can play a positive role in local economic development, but this is not obvious. It is possible that foreign entrants merely capture rents, that the new jobs created may merely crowd out domestic jobs, and that there is no technological spillover, but rather "market stealing", effects on domestic firms. In addition, it is possible that the benefits of FDI differ across economic contexts. For example, the benefits may depend on market size and the time-horizon of foreign capital, which itself is shaped by the institutional environment. This combination of high hopes and unclear evidence puts empirical research in center stage. Thus, it is useful to investigate empirically whether FDI plays a positive role in SADC,

[2] An ongoing World Bank report on SADC regional integration also emphasizes the role of FDI on SADC development.

and if so, in what ways. Many also presume that the FDI inflow levels to the region are too low. How much is too little? What factors can explain the observed FDI inflows?

The current literature does not answer these questions, partly due to the lack of reliable and comparable micro data. New data is now available. The World Bank's investment climate surveys in this region offer comparable cross-country, firm-level data with information that allows us to link foreign ownership to firm performance and behavior in thirteen SADC economies. [3]

The evidence suggests that FDI has significantly facilitated development in the SADC region. Foreign firms tend to perform better, as measured by both sales growth rates and total factor productivity. They tend to be larger, located in richer and better-governed countries with more competitive financial intermediaries. They are also more likely to export than domestic firms. Moreover, domestic firms in the same broad industry tend to benefit from the presence of foreign firms. Since we found positive effects of foreign ownership on local economies, we also examined what determines FDI inflows to this region? To answer this question, we rely on an accepted empirical model to predict the level of FDI inflows per capita (Fan et al. 2009): FDI per capita is a function of market size, infrastructure, education, exchange rates, economic track records (mean growth in the previous 5 years, and the variability of growth in the same period), and institutions. In addition, we look for SADC-specific effects. However, we find that the SADC coefficient is insignificant, which implies that SADC performs as expected, given its average income, human capital, demographic structure, institutions, and economic track record.[4] It seems, therefore, that the usual suspects explain SADC's FDI performance. We did find some significant differences between SADC and the rest of the world in FDI behavior: in SADC, market size as proxied by the income level is less important and openness more so.

[3] The fact that we only have comprehensive investment climate survey for SADC explains why we pick SADC rather than the Sub-Saharan region as the focus region for our study.

[4] Our conclusion may seem to differ from Asiedu (2002), which examines whether Africa differs from other regions in FDI behavior. Their answer is yes. However, there is no contradiction here: they focus on Sub-Saharan Africa, while we focus on the southern African countries (SADC), which attracts relatively more FDI than the rest of Sub-Saharan Africa (Basu and Srinivasan, 2002). Moreover, Asiedu (2002) does not control for country economic performance. So part of the differences may be due to difference in specification.

To shed light on the potential drivers of FDI for this region, we compare SADC with two groups of developing countries with higher FDI per capita. The factors that account for SADC's lower FDI inflows are economic fundamentals: previous growth rates, income, phone density, and the adult share of the population. Interestingly, while income and infrastructure do not matter as much in SADC as in the rest of the world, openness matters more. This is consistent with the view that FDI to small countries is more export-oriented.

The next section discusses firm-level evidence about how foreign ownership affects firm behavior and performance. Section three relies on country-level panel data to understand what determines FDI inflows, and what explains the FDI performance of the SADC region. Section four concludes.

2. Micro Consequences of Foreign Ownership in SADC

If foreign investment supports development, its effects should show up in firm performance or some indicators of "good outcomes", such as export orientation and spillover effects on domestic firms.

A priori it is unclear whether the advent of foreign-owned firms improves firm performance in SADC. SADC might feature differences in the nature of FDI as well as in the complementary factors (such as business environments) for FDI to work its magic. As the domestic markets in SADC tend to be too small (except for a few countries such as South Africa) for R&D investment to make economic sense, technological spillover from R&D of foreign companies (conducted in headquarter countries of multinational companies) may improve local productivity. Moreover, capital shortages or financial constraints may limit firm size, making foreign firms more productive.

To investigate this issue and to provide a rationale for whether FDI has led to real economic benefits to local economies, we investigate how foreign ownership is related to firm performance, as measured by sales growth and total factor productivity, which capture dynamic and static firm performance, respectively. Productivity should capture

what developing countries look for from FDI: scale economies, better technology and managerial know-how. The empirical literature has not reached a consensus about the benefits of foreign ownership on productivity (Caves, 1999). Some found no differences in productivity (for instance, Konings, 2001). Others found some raw differences, which largely disappear when better measurements were provided for input quality. Still others found significant foreign ownership premium in productivity (Yasar and Paul, 2007; Hallward-Driemeier, Wallsten and Xu, 2006; Xu, Zhu and Lin, 2005; Zhang, Zhang and Zhao, 2001).

The Data Set

Our data sets, the investment climate surveys conducted by the World Bank over the past decade, take a snapshot of a country's business environment, including access to finance, physical and regulatory infrastructure, corruption, and the necessary accounting information to estimate productivity. The SADC sample that we use consists of the following countries: Angola (two waves), Botswana (two waves), Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia (two waves), South Africa, Swaziland (two waves), Tanzania (two waves), and Zambia. For each wave, the number of firms range from 75 (Lesotho) to 1057 (South Africa). The firms were randomly sampled from the universe of firms for each country. The surveys have been conducted over the past five years. The sample periods differ by countries, but all are between 2005 and 2009. The data set is cross-sectional in nature.[5]

Table 1 reports the definitions of the variables used in the firm-level regressions, including some of the variables measured at the country level. Table 2 shows the differences in sample characteristics for foreign and domestic firms in the SADC region. Foreign firms are defined to be those with positive foreign ownership.[6] Foreign firms tend to be significantly larger--the median foreign firm in SADC is 70 log points (or 100 percent) larger than domestic ones. The countries they are located in tend to be richer by almost 28 log points. Surprisingly, host countries tend to have higher firing costs. A possible explanation is that, in response to opening up for foreign ownership, countries

[5] When there are two waves for a country, the data are repeated cross sections.
[6] Other thresholds for defining foreign ownership produced qualitatively similar results.

impose higher firing costs to respond to populist demands. Unsurprisingly, foreign firms tend to be located in countries with more competitive banks, which are characterized by lower interest spreads (i.e., the discrepancy between lending and borrowing rates at banks). Similarly, foreign firms tend to be located in countries exhibiting higher indices of government efficiency (by ICRG). Foreign firms tend to suffer lower losses of sales due to crimes.

Our measure of productivity, total factor productivity (TFP), is estimated based on an industry-specific Cobb-Douglas production function for the pooled sample of countries. As a sensitivity check, we also estimate translog TFP (TFPtran hereafter), which is otherwise the same as the above except that we allow for a quadratic production function, which is more general than the Cobb-Douglas specification.

Foreign firms in the SADC region perform better than domestic firms. The median TFP (TFPtran) for foreign firms is higher by 11 (5) log points. Thus, there is some, but a limited, amount of productivity advantage. In terms of sales growth,[7] the median is slightly lower (7.8 versus 9.3 percent), though foreign firms have a significantly higher mean, suggesting that there are a small share of foreign firms having very high growth rates. Finally, the share of foreign firms that export is much greater than that of domestic firms (21 versus 8 percent).

Results on firm performance and foreign ownership

While foreign ownership is clearly associated with better firm performance, it is unclear whether this is due to other variables correlated with foreign ownership. We estimate the following models to test the robustness of the descriptive results:

$$Y_{ic} = FRN_{ic}\delta + F_{ic}\alpha + Z_c\beta + e_{ic} \qquad (1)$$

where *i* refers to a firm, and *c* refers to a country. *Y* is either TFP or the sales growth rate. FRN is foreign ownership. Firm level controls, *F*, include the share of ownership by the largest shareholder, the age of the firm (in logarithm), and the share of losses of sales due

[7] Three years of sales are reported in the data.

to crime.[8] The country level controls, *Z*, include logged GDP per capita, the ICRG index of government efficiency, the firing costs in years of salary, and the interest spread (as a measure of banking competitiveness). All the country-level variables come from the World Development Indicators data base of the World Bank. Since the regressions are at the firm level, while we have country-level explanatory variables, to avoid exaggerating estimation precision, we cluster the standard errors at the country level (Moulton 1986). Table 3 reports the results.

The most important finding is that foreign ownership has a strong and significant relationship with both sales growth and TFP. Increasing foreign ownership by 10 percentage points would increase sales growth by 1.2 percentage points, and TFP by 1.8 percentage points—effects that are non-trivial. To put this in perspective, Table A1 in the appendix provides the comparison of SADC with the East Asia and Pacific region (consisting of China, Indonesia, Malaysia, and Thailand, EAP hereafter) and all non-SADC countries with similar income level as SADCs.[9] Foreign ownership is significantly higher in SADC (17.5 percent) than in EAP (13.5 percent) and the similar-income sample (10.8 percent). In light of the positive effect of foreign ownership and SADC's advantage in this measure, foreign ownership has reduced the disadvantage of SADC toward other regions.

The other findings on performance determinants are also illuminating. The intensity of crime (as measured by the share of sales lost due to crimes) is positively associated with sales growth but negatively with TFP. Firms in countries with higher income levels tend to have higher TFP--a country that is richer by 100 percent tends to have a productivity premium of 7 percent, which could reflect the forces of better institutions and a large market. Unsurprisingly, a higher firing cost and, thus, a higher exit barrier, is associated with lower productivity level. An interpretation is that higher firing costs cause shirking of workers and, therefore, lower efficiency for a fixed amount of capital and labor. This is consistent with what is commonly found in many developing

[8] We have also tried specifications including the share of losses of sales due to power outage and the average level of schooling of firm employees. The results including these additional controls are similar. However, several countries do not have these measures. To preserve as many SADC countries as possible in our sample, we opted to report the results without including them.

[9] That is, with income less than 4600 U.S. dollars of 2000, the level of South Africa.

countries (Xu forthcoming). Another finding is that both sales growth and TFP is negatively affected by higher bank interest spread. Our interpretation is that when banks are less competitive--with a higher interest spread--firms cannot expand as much because capital costs are too high or because it is more difficult to find alternative sources of finance, hence, the lower the sales growth rate. Similarly, a higher interest spread leads to a more distorted capital-labor ratio and, therefore, a lower productivity level. Interestingly, countries with higher government efficiency levels are associated with a higher sales growth rate but lower productivity level. Finally, larger firms tend to grow faster in SADC.

Foreign ownership and exporting status

Exporting may be particularly important for SADC and other African economies that tend to be small. Exports also signal stronger competitiveness in the region. Thus, one way to gauge the benefits of foreign ownership is to examine whether it also helps firms to export. In general, one expects foreign ownership to facilitate exports because foreign firms tend to have better technologies, management know-how, besides possessing better information of exporting opportunities. On the other hand, foreign owners could enter the local market just for quick profits in the domestic market. They may also set up operations in the hosting countries to avoid excessive import tariffs imposed by hosting countries. To investigate this issue, we thus report the following linear probability model:

$$Export_{ic} = \delta\ Frn_{ic} + \alpha\ F_{ic} + \beta\ Z_{c} + \varepsilon_{ic}$$

where *Export* is a dummy variable indicating an exporting firm. Subscripts *i* and *c* indicate firm and country. *Frn* is foreign ownership, *F* is firm characteristics, and *Z* is country characteristics. We also experimented with probit and logit specifications, and the results are very similar. For ease in interpretation of magnitudes, we have opted to report the linear probability model.[10] Again, standard errors are clustered at the country level. The results are in Table 4.

[10] Further controlling for employee schooling and the share of losses due to power shortages does not change our results but reduce our sample significantly.

Relative to a domestic firm, the probability of exporting for a foreign firm is higher by almost 6 percentage points. This effect is quite large since the average probability of exporting for domestic firms is only 6.3 percent. Only a few other determinants of exporting status have statistically significant coefficients. Large firms, not surprisingly, tend to export. Interestingly, firms featuring a higher share of ownership by the largest owner (e.g., a proxy of family ownership) are less likely to export.

Are there Spillover Effects of FDI?

An important benefit from FDI is believed to be the spillover effects of FDI on domestic firms in terms of transfers in technologies, managerial know-hows, and competition effects. The spillover effects can be either horizontal or vertical. Horizontal spillovers refer to effects of the presence of foreign-owned firms on domestic firms within the same industry (or specializing in the same product). There are two counteracting effects related to horizontal spillovers: (a) the positive aspects such as technological spillovers, personnel movements, transfer of managerial know-how, and the cultivation of more efficient local input suppliers; (b) the negative aspects associated with foreign firms being competitors of domestic firms, taking away market shares, increasing the average fixed costs and, therefore, reducing productivity of domestic firms. The positive horizontal effects are also tempered by the fact that foreign firms have strong incentives to reduce the spillover of productive secrets to domestic firms via intellectual property rights and paying for efficiency wages to reduce personnel departures. Thus, the horizontal spillover effects tend to be ambiguous. Indeed, many recent studies find insignificant and even negative horizontal spillover effects—sometimes dubbed the "market-stealing" effect. The reference along this line includes Haddad and Harrison (1993) on Morocco, Aitken and Harrison (1999) on Venezuela, Djankov and Hoekman (2000) on the Czech Republic, and Konings (2001) on Bulgaria, Romania and Poland. The evidence appears to be more positive for the horizontal effects of FDI in developed countries (Haskel et al. 2002; Keller and Yeaple 2003) based on evidence from the United Kingdom and the United States. In contrast, Kee (2010) finds positive horizontal FDI spillover effects due to the cultivating of and the stronger demand for local input suppliers based on a sample of Bangladeshi garment firms. Vertical spillover effects refer to the potential benefits for

input suppliers or clients of foreign companies, such as by offering technological help, stronger quality control, and so on. Since there are no conflicts of interests between foreign firms and their clients and suppliers in technology and managerial know-how spillovers, vertical spillover effects are more likely. This is indeed what is found in Javorcik (2004) for Lithuania. Thus, it is safe to say that the evidence has been at most mixed. In surveying related evidence, Rodrik (1999) stated that "today's policy literature is filled with extravagant claims about positive spillover effects from FDI but the evidence is sobering." The understanding of the spillover effects is further complicated by the idea that the effects of policies tend to differ across contexts due to differences in complementary institutions, regulatory environments, and even skill levels of local employees (Kremer 1993; Hausman, Rodrik and Velasco 2005; Xu forthcoming).

The data only allow us to identify the spillover effects within broad industry categories. We first compute country-industry-level average foreign ownership, weighted by the share of employment in the industry ($FRN_{c,j}$). We then estimate the productivity model with the sample of domestic firms only but adding $FRN_{c,j}$ as an additional regressor. A positive coefficient indicates positive spillovers.[11] Note that we do not interpret the results as pure horizontal spillovers. The industry category in our data is at the two-digit level. The spillovers effect is thus a mixture of both horizontal and vertical spillovers effects—besides the typical horizontal spillovers effect, our broad externality measure also captures the vertical spillovers effect of, say, foreign-owned firms specializing in electronic components on downstream domestic firms specializing on other electronic products.

The results are in Table 5. The results show a robust and positive spillover effect from foreign-owned firms. $FRN_{c,j}$ has a positive and significant coefficient of around 0.22, regardless of the TFP indicator. The magnitude is nontrivial: increasing average foreign ownership by 10 percentage points would increase domestic firms' productivity in the same industry by 2 percentage points. Thus, besides the direct effect of raising

[11] We drop firms in industries with fewer than five domestic firms in order to avoid inference based on too few firms in an industry (of a country).

average productivity, foreign-owned firms also seem to enhance the productivity of domestic firms within broad industries.

3. SADC's FDI inflows per capita in international perspective

Foreign ownership seems to play a significantly positive role in SADC. In this section we examine the relative performance of SADC countries in attracting FDI, as measured by FDI inflow per capita. In particular, what are the key determinants of FDI inflow? What may explain the differences between SADC countries and comparison groups (such as other countries with similar income levels)? We proceed in several steps. First, we lay out a simple theoretical framework for the key determinants of FDI across countries. Second, we explain our empirical framework and key variables. Finally, we present the results from cross-country regressions on FDI.

A Simple Theoretical Framework

The literature on FDI points us towards a relatively simple generic empirical specification (Fan et al., 2009). The modern FDI literature views prospective multinational firms as possessing information-based firm-specific capabilities that they could profitably apply in foreign countries. Indeed, these capabilities allow them to overcome the "difficulties of being foreign" to generate returns to justify the investment (Morck and Yeung 1991, 1992). Agency problems, information asymmetries, and property rights protection problems that render information-based assets inalienable prevent these firms from selling or leasing those capabilities to foreign firms. To profitably apply their unique capabilities abroad, multinationals resort to establishing controlled foreign operations to engage in FDI. Still, FDI is an investment like any other in the sense that it aims to capture positive net present values.

The net present value of a corporate investment project depends on a number of factors. The first is the size of an economy (Caves 1999). With a larger economy, investment projects with high fixed cost components yield higher net present values. All else equal, FDI inflow into larger economies should be higher. The net present value a

firm sees also depends on local product and factor market development and growth potential. It depends negatively on market risks and the costs of doing business. The last is perhaps more important, and contributing factors include high taxes, high wages relative to productivity, and generally poor infrastructure.[12]

All these factors hinge on an economy's institutional environment. If locals make transparent and predictable use of norms, or established legal and political institutions, to adjudicate disputes, the liability of being foreign diminishes and FDI flows in. This consideration echoes the finance and growth literature which emphasizes that sound and well-enforced rules and regulations, like property rights protection and information disclosure, encourage economic development in general and capital market development in particular (La Porta et al. 1997 and 1998; King and Levine 1993). The reason is that these rules and regulations constrain opportunistic behavior and build transactional trust between parties (North 1991). Indeed, governments that are less corrupt, have more efficient bureaucracies and that impose less burdensome regulations foster economic development (La Porta et al. 1998), attract more FDI (Alfaro et al. 2005, Globerman and Shapiro 2002).

In summary, FDI is attracted by basic economic and institutional factors. The economic factors include the size of the market, the current level of development, and measures like education and infrastructure development that affect productivity and expected future development. Obviously, other considerations like trade openness and the host country's currency (see, e.g., Froot and Stein 1991) also may affect FDI. The institutional factors include general measures of "good government" such as the establishment of law and order as well as high quality government bureaucracy.

The empirical relationship

[12] Coughlin, Terza, and Arromdee (1991) provide empirical support for these factors influencing inward FDI, though they do not consider financial development. Froot and Stein (1991), while showing that undervalued host country currencies attract inward FDI, also stress the barriers firms confront in raising capital to finance any new investment projects. These barriers are particularly daunting for domestic firms in economies with underdeveloped capital markets. In such countries, foreign firms could have an advantage in capturing the NPVs of new investment projects because of their access to better functioning foreign capital markets (Foley, Mahir, and Hines, 2004).

Our dependent variable is logged per capita FDI inflows in constant US dollars of 2000, winsorized at the tail 5 percent.[13] We add a constant to this quantity because some countries have negative FDI inflows (negative FDI inflow represents repatriation of previous investment). Dropping the negative FDI inflow observations leads to qualitatively similar results. However, we are not aware of significant economic reasons to exclude the observations.

Our objectives are twofold. First, we wish to empirically investigate the key variables attracting FDI. Second, we wish to see if FDI flowing into SADC behaves similarly to that flowing into other countries. To these ends, we follow the discussion in the previous section and regress each country's FDI inflows on a set of country characteristics associated with the quality of government, along with some basic measures of the level of development and other country characteristics such as population size, demographic characteristics and trade policies. We include SADC in these regressions and then ask whether SADC's FDI inflows behave differently from those in other countries.

We proxy general institutional quality by a commonly-used measure of the more general quality of government: the rule of law index from ICRG. ***Rule of law*** is an ICRG survey result gauging the state of law and order in each country. It ranges from 1 to 6, with higher values connoting greater general respect for the rule of law.[14] It contains a law component, which captures the strength and impartiality of the legal and political establishment in judicial matters, and an order component, which captures the extent to which residents of a country accept established legal and political institutions as the solely legitimate way to make and implement laws and to adjudicate disputes.

We also adopt ICRG corruption index as our ***control of corruption*** index. This indicator is most commonly used in the related economics literature. This variable is

[13] The winsorization is done to prevent the influence of outliers and measurement errors. This variable is highly skewed. The qualitative results are similar when we winsorize at the 1 or 5 percent levels. However, giving the winsorization threshold is around 0 at 5 percent level, the interpretation of magnitude is a lot easier--log(FDI per capita + constant) is close to log(FDI per capita) when the constant is 1.4 instead of around 92, and log point is close to percentage point in interpretation.

[14] ICRG data has the advantage of covering the majority of countries from 1982 on. For details, see Knack and Rahman (2007).

meant to capture the likelihood that government officials will demand special payments, and the extent to which illegal payments are expected throughout low levels of government. In addition to being consistent with previous studies, the variable has the advantage of having the broadest coverage of countries, which maximizes our sample size. The index itself takes on values ranging from zero (most corrupt) to six (least corrupt).

Government track record. The government track record plays an interesting role. FDI is large if foreign corporate investors regard a location's investment opportunities highly. Obviously, investment opportunities are more abundant in locations with better institutions, where government officials are not corrupt, bureaucracies are efficient, and the rule of law is generally upheld. At the same time, positive shocks on investment opportunities often entice governments seeking to attract foreign capital to provide these institutions. Hence, a simple relationship between measures of government quality and foreign direct investment could be misleading. At the very least, to sort this out, our empirical investigation should incorporate a proxy for the presence of profitable investment opportunities. That incidentally is the track record of the government in terms of fostering investment opportunities. These are:

Growth trend is a country's per capita GDP growth rate averaged over the previous five years. We interpret a high past growth rate as both indicative of profitable investment opportunities and a track record of the country's government fostering, or at least not impeding, their exploitation.

Macro volatility is the standard deviation of per capita GDP growth over the prior five years. More unstable economic growth, all else equal, is likely less conducive to FDI, and less indicative of sound and predictable government policies.

General development is measured by the following variables: the ***log of per capita GDP*** in 2000 constant US dollars at PPP; ***education***, measured by the log of the average years of schooling completed by the country's adult population; ***infrastructure***

quality, represented by telephones per 1000 residents; and the ***level of urbanization***,[15] which is the share of urban in total population. These are a set of variables commonly used in the literature (see Coughlin et al. 1991).

Following the discussion in the previous section, we incorporate a set of country characteristics. We include ***country size***, measured as the log of total population, to control for scale. We include the availability of adult labor force, as measured by the ***adult share of the population***,[16] because productivity and growth are positively associated with the proportion of working age adults (Mason 2007).

We include each country's currency ***exchange rate*** relative to the US dollar, all normalized by the rate in 2000. This means that a higher value of *exchange rate* implies a more depreciated local currency. Countries with undervalued currencies, all else equal, attract more FDI (e.g., see, Froot and Stein, 1991).

We also include a measure of ***openness*** (i.e., imports plus exports divided by GDP) for two reasons. More trade openness reduces the need for trade-barrier jumping FDI. At the same time, countries more open may attract more FDI. For example, trade openness may attract vertically-related FDI and may reduce information asymmetry for foreign investors. The variable is lagged by one period to avoid contemporaneous endogeneity bias.

The *SADC dummy*. To address whether FDI inflows to SADC are "exceptional" compared to other countries with similar income levels, we include a SADC dummy variable in the regression.

The specification of our empirical analysis is therefore the following:

$$Ln(FDIPC_{it}) = \alpha_0 + \alpha_{SADC} SADC + X_{it}'\beta + TRACK_{it}\delta + INST_{it}\lambda + \varepsilon_{it} \qquad (1)$$

[15] We have also tried including the percent of GDP accounted by manufacturing and services, and found that they don't matter for attracting FDI after controlling for GDP per capita, urbanization, and other controls.

[16] Adults are defined to be between the age of 15 and 64.

where X represents variables related to general development and other characteristics, including *log GDP per capita, log(mean years of schooling), telephone density, the urban share of population, the adult share of population, log population, exchange rate,* and *openness; TRACK* includes the *growth trend* and its volatility in the past five years; INST are the institutional measures represented by *Rule of Law* or *control of corruption*.[17] Since many of the explanatory variables, especially the institutional variables, tend to be stable over time, using fixed effects would exacerbate the influence of measurement problems (Griliches and Hausman, 1986), we rely on ordinary least square method to estimate our regressions. Because the errors are likely to be correlated within a country, we allow clustering of the error term at the country level (Moulton, 1986).

Summary Statistics

Table 6 reports the differences in key variables between the SADC region and the two comparison groups for the 2001 to 2006 period, namely, the non-SADC countries and the non-SADC countries with similar income levels. The latter group drops those country-year observations whose incomes exceeds the highest income level for the countries within the SADC region. The SADC region has an average growth rate in real GDP per capita of 2.3 percent, lower than the non-SADC group (3.1 percent) and the similar-income sample (3.1 percent) by 0.8 percentage points. The average GDP per capita is around 1300 U.S. dollars, slightly higher than the similar-income sample, and much lower than the non-SADC sample. Per capital FDI is 36.6 U.S. dollars (in 2000 value), about 18 percent of the average for the non-SADC sample (202.8 dollars), and 58 percent of the similar-income sample (63.2 dollars). The two proxies of institutions, the rule of law index and the control of corruption index, are similar between SADC and the similar-income sample, but slightly lower than the non-SADC sample. Thus, it appears that SADC lags slightly behind in attracting FDI inflows relative to similar-income countries, and much behind when compared with the non-SADC sample. Moreover, it seems that

[17] There are some missing observations for the rule of law, corruption, and schooling. Since dropping all missing observations for these variables would entail a significant loss of sample, we impute these variables with basic country indicators such as GDP per capita and the urbanization share; we then also include missing indicators for the three vairables to capture potential mis-imputation. We reach similar conclusions about our key results if we drop the sample containing the missing observations for the three variables.

the institutional disadvantage is negligible; key disadvantages for SADC seem to be its lower growth rate and its lower income level to the extent that these factors are important.

Results

Table 7 reports the results. The pooled-sample results appear in the first three columns, and the similar-income sample results are reported in the next two columns. The institutional variable is the rule of law in Column (1), and the control-of-corruption index in Column (2). Column (3) adds "trade/GDP lagged" as an additional control to test the robustness of our results. The structure of the last two columns with the similar-income subsample is similar--except that we do not report the results using the control-of-corruption index as an alternative institutional measure.[18]

The alternative measures of institutions yield similar results (see columns (2) and (3)). In addition, adding lagged trade/GDP does not change our main results. However, since trade/GDP can be affected by FDI, it is potentially endogenous. Thus, we leave it out of our base specification. But for readers who are concerned that a major omitted variable might be openness, our main results are unaffected by its inclusion. Finally, the main results from the similar-income sample are also similar to those of the pooled sample.

We thus focus on Column (1). Good governments with good economic track records attract FDI. The average growth in the previous five years appears with a positive and significant coefficient while growth volatility has the opposite sign (though statistically insignificant). The general government quality, the *rule of law* variable, does not directly affect FDI. Growth expectations, therefore, are the most important determinant of FDI amongst the government quality variables.

Measures of economic fundamentals matter a great deal. Schooling, though statistically insignificant, has the expected sign. Phone density is significant, indicating that FDI tends to flow to countries with better infrastructure. Similarly, FDI tends to flow to richer countries, due perhaps to better protection of property rights, market sizes

[18] The results are very similar and are available upon request.

and so on. Another important variable is the share of adult labor force in total population, which has the expected positive sign and is highly significant. This is potentially worrisome for SADC because the region has a higher share of dependents than other regions. Interestingly, countries with a smaller population tend to have higher FDI per capita—perhaps the benefits of FDI (such as through bringing export opportunities) are higher for smaller countries, which face a tighter constraint of small domestic markets.

The SADC dummy is not statistically significant. This means that once we control for the observed variables, the region on average does not lag behind other countries in attracting FDI per capita. Thus, to look for signs why SADC is lower in FDI per capita, we need to focus on the explanatory variables.

A more general test for SADC difference is to allow SADC to interact with our key explanatory variables. In our exploratory estimations we allow the coefficients of our main variables to be different for SADC than for the rest of the sample. It turns out that only the interaction terms with phone density, income level, and openness are close to being statistically significant. Thus, we report a specification in Table 8 in which the SADC dummy variable is interacted with these three variables. The coefficients of the non-interacting variables remain largely the same. The SADC dummy variable still is statistically insignificant. Regarding the three interaction terms, SADC × GPD per capita, SADC × openness, and SADC × phone density are all statistically significant. For SADC, phone density is not important for attracting FDI. Neither is the income level, which makes sense since—for the relatively small SADC countries, market size (which income level partially measure) is not important because FDI probably tends to be export-oriented, a tendency confirmed by our earlier firm-level analysis. Finally, openness is much more important, with a coefficient that is twice that of the rest of the world. Again, our interpretation is that for small countries, openness increases the expected value of FDI as openness facilitates exports. In other words, there is a stronger complementarity of openness and FDI for SADC.

What Explains the SADC Disadvantage in FDI?

To shed light on how the key variables explain the relatively low FDI per capita in SADC, we choose two comparison groups: the East-Asia Pacific countries (EAP, consisting of China, Indonesia, Malaysia, and Thailand), and the similar-income sample (consisting of all countries in our sample that have the same range of income per capita as the SADC). While our choice of the similar-income sample is easy to understand, we pick EAP in order to see what explains the gap between SADC and the front-runners among the developing countries. The results are contained in Table 9.

The first comparison concerns SADC versus EAP. The difference in the dependent variable is 1.08 in favor of EAP. The percent of this difference explained by variable X_k is calculated as $100 * \beta_k (EX_{k,EAP} - EX_{k,SADC}) / \Delta Y$, where $\beta_k, EX_{k,R}, \Delta Y$ are the estimated coefficients, the mean X_k for region *R*, and the difference in the outcome, respectively. The higher adult share of population in EAP explains 43 percent of the observed difference. The higher previous growth rate explains a further 32 percent. EAP's advantage in phone density explains another 24 percent. The income level advantage of EAP adds 16 percent, and a better schooling becomes the last (somewhat) important factor, explaining about 9 percent. Country sizes actually help SADC countries since they tend to be smaller, which appears positively correlated with FDI per capita.

The second comparison is between SADC and countries with similar income. The comparison group has an advantage in the dependent variable of 0.41. The most important variables are phone density (43 percent), the adult share of population (39 percent), the income level (23 percent), and previous growth rates (7 percent).

4. Conclusions

Have FDI inflows played a positive role in SADC economies? Are SADC countries attracting too little FDI? What can be done to attract more FDI to this region? The answer to the first question is yes. We found strong evidence that FDI helped South African economies. Foreign firms tend to be larger, export more, have higher

productivity and sales growth rates, and thus the presence of these firms tend to raise the average firm performance and create jobs for host countries. Moreover, domestic firms in the same industry tend to benefit from a stronger presence of foreign firms. In trying to answer the second question, we find that FDI flows to countries with a good government track record, as indicated by stable high growth in the past and good economic fundamentals (i.e., phone density, the adult share of population, and income level). Usual suspects – *corruption* or the rule of law – do not significantly affect FDI. Most importantly, we do not find exceptionalism in SADC's ability to attract foreign direct investment: the SADC dummy is never statistically different from zero. There may be some differences between SADC and the rest of the world in FDI behavior: the income level appears less important, and openness might be particularly important. Our comparisons with other regions suggest that SADC has lower FDI per capita due to poorer economic fundamental (previous growth rates, lower income level, phone density, and the adult share of the population). The accounting exercise raises another question: Why do SADC countries have worse economic fundamentals? This is beyond the scope of this paper. But there are plenty of analyses shedding light on this question. Some of the potential culprits include ethnic polarization (Easterly and Levine, 1997), political instability and civil wars (Collier and Gunning 1999), among others. The key for attracting FDI in SADC would be to build a fundamentally sound economy that naturally lures FDI. In addition, our results indicate that openness is especially important for SADC. Policies and procedures to encourage openness would therefore be especially important for the region.

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Table 1. Definitions of variables in firm-level analysis

Variable	Definitions
FRN	Share of foreign ownership
largest owner	Ownership shares by the largest shareholder.
ln(firm age)	The logarithm of firm age.
Loss_crime	The share of losses in sales due to crime.
Ln(GDPpc)	Ln(GDP per capita of the country)
Firing_cost	Firing costs in terms of weeks of wages, from WDI.
Interest_spread	Interest spread, from WDI.
Govt_efficiency	Government effectiveness index, from ICRG.
Control_CR	Control of corruption, from ICRG.

Table 2. Summary statistics at firm level for the SADC region as a whole

	Foreign firms			**Domestic firms**		
	mean	p50	sd	mean	p50	sd
Ln(L)	3.395	3.091	1.619	2.530	2.398	1.333
Ln(GDPpc)	7.013	7.230	1.201	6.852	6.951	1.181
Firing_cost	61.230	53.200	41.204	53.537	32.000	41.339
Interest_spead	10.583	7.587	10.571	12.157	8.720	12.880
Govt_efficiency	-0.176	-0.306	0.746	-0.273	-0.334	0.754
Sales growth	0.405	0.078	1.370	0.285	0.093	1.008
TFP	0.079	0.008	0.630	-0.057	-0.098	0.522
TFPtran	0.091	0.023	0.581	0.001	-0.030	0.492
Exporter	0.207	0.000	0.406	0.077	0.000	0.267
FRN	0.834	1.000	0.264	0.000	0.000	0.000
Largest owner	0.711	0.700	0.245	0.839	1.000	0.241
Ln(firm age)	2.139	2.079	0.984	2.036	1.946	0.968
Loss_crime	0.012	0.000	0.038	0.021	0.000	0.514

Table 3. Effects of foreign ownership: SADC sample

	sales growth	TFP	TFPtran
foreign ownership	0.200**	0.184***	0.141***
	(0.081)	(0.050)	(0.048)
largest owner	0.174**	-0.022	0.029
	(0.075)	(0.035)	(0.026)
ln(firm age)	-0.168***	0.000	-0.018
	(0.049)	(0.012)	(0.012)
loss_crime	0.039***	-0.015***	-0.022***
	(0.003)	(0.002)	(0.001)
ln(GDPpc)	-0.218***	0.065	0.075**
	(0.053)	(0.041)	(0.036)
firing_costs	-0.001*	-0.002***	-0.002***
	(0.001)	(0.000)	(0.000)
interest spread	-0.015***	-0.004**	-0.004***
	(0.003)	(0.002)	(0.001)
government effectiveness	0.170*	-0.081	-0.123*
	(0.101)	(0.067)	(0.065)
ln(sales)	0.041		
	(0.025)		
industry dummies	yes	no	no
Number of observations	3,842	2,938	2,929
Adjusted R2	0.094	0.083	0.066

standard errors in parentheses, clustered at the country level.
*, ** and ***: statistical significance at the 10, 5 and 1 percent levels.

Table 4. Exporting and Foreign ownership: The SADC sample

	exporter
foreign	0.055***
	(0.021)
largest owner	-0.061***
	(0.024)
ln(firm age)	0.012
	(0.009)
loss_power	0.000
	(0.001)
ln(GDPpc)	0.000
	(0.016)
fire_cost	-0.000
	(0.000)
interest_spread	-0.001
	(0.001)
government effectiveness	-0.008
	(0.021)
industry dummies	yes
lnS	0.037***
	(0.004)
Number of observations	6,248
Adjusted R2	0.189

standard errors in parentheses, clustered at the country level.
*, ** and ***: statistical significance at the 10, 5 and 1 percent levels.

Table 5. Effects of foreign ownership on productivity of SADC domestic firms

	TFP	TFPtran	TFP	TFPtran
largest owner	0.016	0.070**	0.012	0.066**
	(0.039)	(0.028)	(0.038)	(0.026)
ln(firm age)	-0.003	-0.021	-0.004	-0.023
	(0.016)	(0.014)	(0.016)	(0.015)
loss_crime	-0.014***	-0.021***	-0.015***	-0.022***
	(0.001)	(0.001)	(0.002)	(0.001)
ln(GDPpc)	0.091***	0.094***	0.079**	0.081***
	(0.029)	(0.026)	(0.031)	(0.029)
firing_costs	-0.002***	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
interest spread	-0.003**	-0.003***	-0.003**	-0.003**
	(0.001)	(0.001)	(0.001)	(0.001)
government effectiveness	-0.108*	-0.147***	-0.092	-0.129*
	(0.059)	(0.057)	(0.067)	(0.067)
Industry-level employment-weighted	0.213**	0.232***		
average foreign ownership	(0.096)	(0.082)		
Number of observations	2,215	2,210	2,215	2,210
Adjusted R2	0.076	0.066	0.074	0.062

Note. Standard errors in parentheses, clustered at the country level.
***, **, and * represent statistical significance at the 1, 5 and 10 percent levels.
The sample consists of domestic firms in SADC countries..

Table 6. Summary Statistics for SADC and Comparator countries: 2001-2006 average.

	SADC	Non-SADC	Non-SADC: similar income countries
	Mean	Mean	Mean
Real growth rate of GDP per capita	2.261	3.128	3.102
GDP per capital, USD real	1,289.358	7,248.203	1,229.144
FDI per capita	36.599	202.808	63.167
FDI/GDP	0.037	0.068	0.041
Rulelaw	0.991	1.181	0.946
Control_CR	0.651	0.834	0.661

Table 7. Is the SADC region different?
The dependent variable is ln(FDI per capita + constant)

	The Pooled Sapmle			The similar-income sample	
	coef/se	**coef/se**	**coef/se**	**coef/se**	**coef/se**
$\ln(\text{schooling}_{t-1})$	0.198	0.200	0.138	0.218	0.065
	(0.170)	(0.166)	(0.177)	(0.169)	(0.175)
$\ln(\text{phone density}_{t-1})$	0.243**	0.231**	0.261**	0.159	0.121
	(0.116)	(0.111)	(0.114)	(0.110)	(0.106)
the adult share of population_{t-1}	4.391**	4.456**	2.505	4.914**	3.621*
	(2.103)	(2.086)	(2.097)	(2.080)	(2.000)
urban share_{t-1}	0.334	0.348	0.145	0.378	0.456
	(0.614)	(0.610)	(0.616)	(0.653)	(0.642)
Ln(population)	-0.123*	-0.124**	-0.009	-0.177***	-0.047
	(0.063)	(0.063)	(0.068)	(0.061)	(0.064)
Relative $\text{exchange rate}_{t-1}$	-0.002*	-0.002	-0.002**	0.003	0.001
	(0.001)	(0.001)	(0.001)	(0.008)	(0.009)
$\text{Ln(GDPpc}_{t-1})$	0.275*	0.268*	0.326**	0.300*	0.376**
	(0.148)	(0.149)	(0.151)	(0.159)	(0.156)
Mean GDPpc growth	0.075***	0.074***	0.072***	0.069***	0.068***
in the previous 5 yrs	(0.015)	(0.015)	(0.013)	(0.015)	(0.014)
S.D. GDPpc growth	-0.890	-0.860	-1.304*	-0.693	-1.071
in the previous 5 yrs	(0.714)	(0.706)	(0.738)	(0.680)	(0.715)
Rulelaw_{t-1}	0.025		0.036	0.018	0.014
	(0.056)		(0.055)	(0.057)	(0.058)
Control of Corruption_{t-1}		0.064			
		(0.070)			
Trade/GDP_{t-1}			0.702***		0.960***
			(0.160)		(0.195)
SADC dummy	0.018	-0.011	-0.117	0.049	-0.085
	(0.305)	(0.306)	(0.286)	(0.287)	(0.255)
Number of observations	3,265	3,265	3,187	2,311	2,269
Adjusted R2	0.442	0.443	0.455	0.376	0.409

Note. ***, **, and * represent statistical significance at the 1, 5 and 10 percent levels.
Standard errors clustered at the country level.
The constant in the dependent variable is 1.4.

Table 8. Is SADC Different? Another Look
The dependent variable is ln(FDI per capita + constant)

$\ln(\text{schooling}_{t-1})$	0.109
	(0.631)
$\ln(\text{phone density}_{t-1})$	0.308***
	(2.711)
$\text{the adult share of population}_{t-1}$	2.560
	(1.263)
urban share_{t-1}	0.091
	(0.148)
Ln(population)	-0.015
	(-0.228)
$\text{Relative exchange rate}_{t-1}$	-0.002*
	(-1.743)
$\text{Ln(GDPpc}_{t-1})$	0.329**
	(2.149)
Mean GDPpc growth in the previous 5 yrs	0.077***
	(5.839)
S.D. GDPpc growth in the previous 5 yrs	-1.388*
	(-1.862)
Rulelaw_{t-1}	0.018
	(0.341)
Trade/GDP_{t-1}	0.639***
	(3.924)
SADC	1.928
	(1.347)
SADC * $\ln(\text{phone density}_{t-1})$	-0.293*
	(-1.791)
SADC * $\text{Ln(GDPpc}_{t-1})$	-0.386*
	(-1.696)
SADC * Trade/GDP_{t-1}	0.683*
	(1.939)
Number of observations	3,187
Adjusted R2	0.464

Note: ***, **, and * represent statistical significance at the 1, 5 and 10 percent levels.

Standard errors clustered at the country level.

The constant in the dependent variable is 1.4.

Table 9. Accounting for the log FDI per capita outcome

		Mean for		Δy= 1.08
	Coeff	SDDC	EAP	$\beta_k (EX_{EAP} - EX_{SADC})$
Independent variables:		2.09	3.17	
Share of adult population$_{t-1}$	4.37	0.53	0.64	42.58
Mean real GDPpc growth rate in the previous five years	0.08	0.59	5.17	31.81
ln(phone density$_{t-1}$)	0.24	0.42	1.50	24.23
ln(GDPpc$_{t-1}$)	0.27	6.41	7.05	16.35
ln(schooling)	0.20	1.10	1.60	9.33
urban$_{t-1}$	0.33	0.31	0.37	2.08
S.D. of real GDPpc growth rate in the previous five years	-0.89	0.07	0.06	1.32
rulelaw$_{t-1}$	0.03	2.62	3.14	1.22
Relative exchange rate$_{t-1}$	0.00	2.71	0.69	0.32
ln(population)	-0.12	1.91	4.83	-33.30
		SDDC mean 2.09	similar income countries: mean 2.50	Δy = 0.41
ln(phone density$_{t-1}$)	0.24	0.42	1.15	43.04
Share of adult population$_{t-1}$	4.37	0.53	0.57	38.51
ln(GDPpc$_{t-1}$)	0.27	6.41	6.75	22.66
urban$_{t-1}$	0.33	0.31	0.43	9.64
Mean real GDPpc growth rate in the previous five years	0.08	0.59	0.98	7.09
ln(population)	-0.12	1.91	1.66	7.58
ln(schooling)	0.20	1.10	1.18	3.86
Relative exchange rate$_{t-1}$	0.00	2.71	0.69	0.84
S.D. of real GDPpc growth rate in the previous five years	-0.89	0.07	0.08	-2.53
rulelaw$_{t-1}$	0.03	2.62	2.46	-1.01

Note. The results for other variables are not reported.

The coefficients are based on the same specification in Column (1) of Table 7--except that we do not control for SADC dummy here, since it is not statistically significant.

The Appendix

Table A.1. Mean Characteristics for SADC, EAP and the similar-income sample

	mean SADC	mean EAP	mean Similar income as SADC
Foreign	0.175	0.135	0.108
Largest owner	0.813	0.678	0.753
ln(firm age)	2.058	2.354	2.324
Loss_crime	0.020	0.004	0.012
ln(GDPpc)	6.886	7.247	6.937
Fire_cost	55.152	88.344	64.715
interest_spread	11.822	3.542	9.335
govt_efficiency	-0.253	0.052	-0.275
ln(sales)	4.856	8.288	6.361

Note. "Similar income as SADC" means income less than 4600 USD (in 2000 value)